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APPLE, PEACH AND GRAPE: ESTIMATED ESTABLISHMENT COSTS, ONTARIO, 1989

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ECONOMICS INFORMATION

REPORT NO. 89-03

APPLE, PEACH AND GRAPE
ESTIMATED ESTABLISHMENT COSTS
ONTARIO, 1989

by

Errol D. McKibbon

Economics and Policy Coordination Branch
Ontario Ministry of Agriculture and Food
Legislative Buildings, Queen's Park
Toronto, Ontario, M7A 1B6

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch now use micro-computers in the preparation of cost data. Computer simulation now replaces the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models will accurately reflect the appropriate production technology for each commodity.

Information on inputs is obtained from a number of sources, including:

1. previous studies done by this Branch;
2. surveys of the farm supply trade;
3. technical input/output coefficients; and
4. the consensus of producers, researchers, extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture, modified and rewritten by the Economics and Policy Coordination Branch to accommodate Ontario agricultural conditions. The 1989 cost of production estimates presented in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each establishment cost estimate was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers, extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of establishment both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labour, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, and interest on operating capital. Fixed cost inputs are operator labour, interest on land and machinery, depreciation on machinery, and other overhead cost items.

LABOUR HOURS AND COSTS

The required number of labour hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. The operator labour hours were valued at $8.00 per hour.

The hired labour cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etcetera.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 7.7 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 13.0 percent, plus one for a total of 14.0 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were originally based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food, with subsequent updating based on price indices provided by Statistics Canada.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 26.0 cents/litre; diesel - 23.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

Fuel costs are net of all 1989 Provincial and Federal rebates. The Federal Sales Tax rebate is scheduled to be reduced on January 1, 1990 for both gasoline and diesel. Also, the Federal Excise rebate on gasoline is being eliminated effective January 1, 1990.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis, and obtained from report number 89-01 "A Survey of Custom Farmwork Rates Charged in Ontario, 1988.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farm land have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the prime rate for 1988 of 10.8 percent discounted for the rate of inflation (4.0%), which resulted in a 6.8 percent rate. It was assumed that land for all study crops would be purchased in the previous year prior to cropping.

No farm real estate taxes were charged to any study crop because of the 1989 Ontario Farm Tax Reduction Program.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the end of the fourth year of establishment. Operating capital includes the cost of materials, fuel, repairs, hired labour and other cash items. In this study, the interest rate applied to operating capital was the average estimated prime rate for 1989 of 13.0 percent plus 1 percent for a rate of 14.0 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

APPLE ORCHARD ESTABLISHMENT

The apple orchard under consideration is planted on semi-dwarf rootstock at a medium density of 300 trees per acre. The establishment of this orchard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 1.--Apples on Size-Controlling Trees, "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Fertilizer, 15-15-15 250 kg/ha	59	24
Cover crop seed	15	6
Fumigant	455	184
Tractor and machine costs:		
Repairs and maintenance	22	9
Fuel	17	7
Custom fumigation	37	15
Interest on operating capital	316	128
TOTAL VARIABLE COSTS	**921**	**373**
FIXED COSTS		
Operator labour, 11.1 hr./ha	89	36
Tractor and machine costs:		
Depreciation	49	20
Interest on investment	32	13
Insurance and housing	10	4
Interest on land, $4,450/ha @ 6.8% per annum	151	61
TOTAL FIXED COSTS	**331**	**134**
TOTAL "PREPLANT YEAR" COSTS	**1,252**	**507**

Table 2.--Apples on Size-Controlling Trees, "Preplant Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Discing	2	2.47	1.0	47.17	19.09
Cultivating	1	1.24	.5	30.35	12.28
Sow cover crop	1	2.47	1.0	36.47	14.76
Plowing	1	2.47	1.0	56.22	22.75
Soil packing	1	2.47	1.0	49.57	20.06

Table 3.--Apples on Size-Controlling Trees, "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 87.7 hr./ha	425	172
Fertilizer, 15-15-15 250 kg/ha	57	23
Insecticides	121	49
Fungicides	183	74
Herbicides	89	36
Trees, 300 semi-dwarf	3,558	1,440
Tree guards, 300	400	162
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	138	56
Fuel	121	49
Equipment rental	124	50
Interest on operating capital	2,563	1,037
TOTAL VARIABLE COSTS	**7,789**	**3,152**
FIXED COSTS		
Operator labour, 84.0 hr./ha	672	272
Tractor and machine costs:		
Depreciation	255	103
Interest on investment	158	64
Insurance and housing	54	22
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Other overhead	99	40
TOTAL FIXED COSTS	**1,539**	**623**
TOTAL "PLANTING YEAR" COSTS	**9,328**	**3,775**

Table 4.--Apples on Size-Controlling Trees, "Planting Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Discing	2	2.47	1.0	42.20	17.08
Design and layout	a	19.8	8.0	193.50	78.31
Digging holes	1	24.7	10.0	525.36	212.60
Planting	1	59.3	24.0	410.59	166.16
Watering	1	9.88	4.0	196.69	79.60
Fertilizing	1	4.94	2.0	53.06	21.47
Weed spraying	2	4.94	2.0	105.91	42.86
Discing	3	3.71	1.5	63.33	25.63
Spray Pesticide	3	2.47	1.0	86.61	35.05
Summer management	a	12.4	5.0	98.84	40.00
Installing tree guards	1	24.7	10.0	160.47	64.94
Apply mouse bait	1	2.47	1.0	11.74	4.75

a Operation performed as required.

Table 5.--Apples on Size-Controlling Trees, "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 13.6 hours/ha	77	31
Fertilizer:		
15-15-15, 250 kg/ha	57	23
Ammonium nitrate, 125 kg/ha	30	12
Insecticides	267	108
Fungicides	255	103
Herbicides	119	48
Trees, 15 replacements	178	72
Cover crop seed	89	36
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	69	28
Fuel	44	18
Interest on operating capital	418	169
TOTAL VARIABLE COSTS	**1,613**	**652**
FIXED COSTS		
Operator labour, 63.0 hr./ha	504	204
Tractor and machine costs:		
Depreciation	124	50
Interest on investment	84	34
Insurance and housing	25	10
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Other overhead	99	40
TOTAL FIXED COSTS	**1,137**	**460**
TOTAL "SECOND YEAR" COSTS	**2,750**	**1,112**

Table 6.--Apples on Size-Controlling Trees, "Second Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replant trees	a	9.88	4.0	100.62	40.72
Prune & train	a	19.8	8.0	158.14	64.00
Fertilizing	2	7.42	3.0	89.53	36.23
Weed spraying	2	4.94	2.0	105.91	42.86
Discing	2	2.47	1.0	42.23	17.09
Spray Pesticide	5	3.71	1.5	129.90	52.57
Summer management	a	17.3	7.0	138.38	56.00
Disc & harrow	2	3.71	1.5	66.22	26.80
Sow cover crop	1	2.47	1.0	31.53	12.76
Apply mouse bait	1	2.47	1.0	11.74	4.75
Spot weed control	a	2.47	1.0	52.95	21.43

a Operation performed as required.

Table 7.--Apples on Size-Controlling Trees, "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 45.7 hr./ha	259	105
Fertilizer:		
15-15-15, 400 kg/ha	94	38
Ammonium nitrate, 125 kg/ha	30	12
Insecticides	267	108
Fungicides	255	103
Herbicides	59	24
Trees, 3 replacements	35	14
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	64	26
Fuel	30	12
Interest on operating capital	230	93
TOTAL VARIABLE COSTS	**1,333**	**539**
FIXED COSTS		
Operator labour, 68.0 hr./ha.	544	220
Tractor and machine costs:		
Depreciation	99	40
Interest on investment	69	28
Insurance and housing	20	8
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Other overhead	99	40
TOTAL FIXED COSTS	**1,132**	**458**
TOTAL "THIRD YEAR" COSTS	**2,465**	**997**

Table 8.--Apples on Size-Controlling Trees, "Third Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replanting trees	a	2.47	1.0	41.32	16.72
Prune & train	a	61.8	25.0	434.89	176.00
Fertilizing	2	7.41	3.0	89.53	36.23
Weed spraying	1	2.47	1.0	52.95	21.43
Mowing	3	3.71	1.5	108.92	44.08
Spray Pesticide	5	3.71	1.5	129.90	52.57
Summer management	a	22.2	9.0	177.91	72.00
Apply mouse bait	1	2.47	1.0	11.74	4.75
Tree guard adjusting	a	7.41	3.0	35.21	14.25

a Operation performed as required.

Table 9.--Apples on Size-Controlling Trees, "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 32.1 hr./ha	190	77
Fertilizer:		
Muriate of potash, 200 kg/ha	42	17
Ammonium nitrate, 90 kg/ha	20	8
Insecticides	304	123
Fungicides	292	118
Herbicides	104	42
Trees, 3 replacements	35	14
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	84	34
Fuel	35	14
Interest on operating capital	79	32
TOTAL VARIABLE COSTS	**1,195**	**483**
FIXED COSTS		
Operator labour,58.1 hr./ha.	455	184
Tractor and machine costs:		
Depreciation	131	53
Interest on investment	94	38
Insurance and housing	27	11
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Other overhead	99	40
TOTAL FIXED COSTS	**1,107**	**448**
TOTAL "FOURTH YEAR" COSTS	**2,302**	**931**

Table 10.--Apples on Size-Controlling Trees, "Fourth Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replanting trees	a	2.47	1.0	41.32	16.72
Prune & train	a	49.4	20.0	345.94	140.00
Fertilizing	2	4.94	2.0	72.92	29.51
Weed spraying	2	4.94	2.0	105.91	42.86
Mowing	4	4.94	2.0	145.25	58.78
Spray Pesticide	7	4.94	2.0	173.22	70.10
Summer management	a	14.8	6.0	118.61	48.00
Applying mouse bait	1	2.47	1.0	11.74	4.75

a Operation performed as required.

Table 11.--Apples on Size-Controlling Trees, Total Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
Preplanting Year	1,252	507
Planting Year	9,328	3,775
Second Year	2,750	1,112
Third Year	2,465	997
Fourth Year	2,302	931
TOTAL	**18,097**	**7,322**

CONCLUSIONS

The total cost of establishing this size-controlling apple orchard, estimated at $7,322 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the productive cycle, an amortization rate of 6.8 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $7,322 establishment cost using a 6.8 percent rate gives an annual cost of $681 per acre for each year of the production period.

PEACH ORCHARD ESTABLISHMENT

The peach orchard under consideration is planted at 145 trees per acre. The establishment of this orchard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 12.--Peach "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Fumigant	455	184
Tractor and machine costs:		
Repairs and maintenance	22	9
Fuel	17	7
Custom fumigation	37	15
Interest on operating capital	279	113
TOTAL VARIABLE COSTS	**810**	**328**
FIXED COSTS		
Operator labour, 9.9 hr./ha.	79	32
Tractor and machine costs:		
Depreciation	47	19
Interest on investment	30	12
Insurance and housing	10	4
Interest on land, $22,240/ha @ 6.8% per annum	756	306
TOTAL FIXED COSTS	**922**	**373**
TOTAL "PREPLANT YEAR" COSTS	**1,732**	**701**

Table 13.--Peach "Preplant Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	2.47	1.0	56.22	22.75
Discing	2	2.47	1.0	47.17	19.09
Rotovating	1	2.47	1.0	52.68	21.32
Soil packing	1	2.47	1.0	49.57	20.06

Table 14.--Peach "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 71.7 hr./ha.	363	147
Fertilizer, 15-15-15, 100 kg/ha.	22	9
Insecticides	82	33
Cover crop seed	12	5
Trees, 145	1,972	798
Tree guards, 145	193	78
Tractor and machine costs:		
Repairs and maintenance	96	39
Fuel	74	30
Equipment rental	124	50
Interest on operating capital	1,441	583
TOTAL VARIABLE COSTS	**4,379**	**1,772**
FIXED COSTS		
Operator labour, 35.8 hr./ha.	287	116
Tractor and machine costs:		
Depreciation	175	71
Interest on investment	114	46
Insurance and housing	40	16
Interest on land, $22,240/ha @ 6.8% per annum	1,512	612
Other overhead	99	40
TOTAL FIXED COSTS	**2,227**	**901**
TOTAL "PLANTING YEAR" COSTS	**6,606**	**2,673**

Table 15.--Peach "Planting Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Discing	1	2.47	1.0	42.23	17.09
Levelling	1	2.47	1.0	39.34	15.92
Pick up trees	1	4.94	2.0	98.99	40.06
Planting trees	a	39.5	16.0	425.13	172.04
Discing	2	2.47	1.0	42.23	17.09
Harrowing	2	2.47	1.0	39.49	15.98
Hand weeding	a	7.41	3.0	35.21	14.25
Pruning	a	17.3	7.0	138.38	56.00
Spray Pesticides	3	3.71	1.5	129.91	52.57
Sow cover crop	1	2.47	1.0	31.53	12.76
Install tree guards	a	12.4	5.0	80.24	32.47
Mowing	4	4.94	2.0	145.25	58.78
General maintenance	a	4.94	2.0	23.48	9.50

a Operation performed as required.

Table 16.--Peach "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 11.1 hr./ha.	67	27
Fertilizer, 15-15-15, 100 kg./ha.	22	9
Insecticides	67	27
Fungicides	35	14
Herbicides	44	18
Cover crop seed	12	5
Trees, 10 replacements	69	28
Tractor and machine costs:		
Repairs and maintenance	77	31
Fuel	32	13
Interest on operating capital	148	60
TOTAL VARIABLE COSTS	**573**	**232**
FIXED COSTS		
Operator labour, 34.6 hr./ha.	277	112
Tractor and machine costs:		
Depreciation	114	46
Interest on investment	82	33
Insurance and housing	25	10
Interest on land, $22,240/ha @ 6.8% per annum	1,512	612
Other overhead	99	40
TOTAL FIXED COSTS	**2,109**	**853**
TOTAL "SECOND YEAR" COSTS	**2,682**	**1,085**

Table 17.--Peach "Second Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replanting trees	a	4.94	2.0	39.54	16.00
Pruning	a	17.3	7.0	138.38	56.00
Discing	4	4.94	2.0	84.46	34.18
Sow cover crop	1	2.47	1.0	31.53	12.76
Weed spraying	1	2.47	1.0	52.95	21.43
Spray Pesticide	4	4.94	2.0	173.22	70.10
Mowing	3	3.71	1.5	108.92	44.08
General maintenance	a	4.94	2.0	39.54	16.00

a Operation performed as required.

Table 18.--Peach "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 28.4 hr./ha.	171	69
Fertilizer, 15-15-15, 100 kg./ha.	22	9
Insecticides	255	103
Fungicides	124	50
Herbicides	44	18
Cover crop seed	12	5
Trees, 5 replacements	69	28
Tractor and machine costs:		
Repairs and maintenance	116	47
Fuel	40	16
Interest on operating capital	180	73
TOTAL VARIABLE COSTS	**1,033**	**418**
FIXED COSTS		
Operator labour, 32.1 hr./ha.	257	104
Tractor and machine costs:		
Depreciation	156	63
Interest on investment	114	46
Insurance and housing	32	13
Interest on land, $22,240/ha @ 6.8% per annum	1,512	612
Other overhead	99	40
TOTAL FIXED COSTS	**2,170**	**878**
TOTAL "THIRD YEAR" COSTS	**3,203**	**1,296**

Table 19.--Peach "Third Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replanting trees	a	2.47	1.0	19.77	8.00
Pruning	a	34.6	14.0	242.16	98.00
Discing	4	4.94	2.0	84.46	34.18
Sowing cover crop	1	2.47	1.0	31.53	12.76
Weed spraying	1	2.47	1.0	52.95	21.43
Spray Pesticide	8	9.88	4.0	346.43	140.20
Mowing	3	3.71	1.5	108.92	44.08

a Operation performed as required.

Table 20.--Peach "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 75.4 hr./ha.	413	167
Fertilizer, 15-15-15, 100 kg./ha.	22	9
Insecticides	306	124
Fungicides	282	114
Herbicides	44	18
Cover crop seed	12	5
Paint and repellant	72	29
Tractor and machine costs:		
Repairs and maintenance	116	47
Fuel	40	16
Interest on operating capital	91	37
TOTAL VARIABLE COSTS	**1,398**	**566**
FIXED COSTS		
Operator labour, 42.0 hr./ha.	336	136
Tractor and machine costs:		
Depreciation	156	63
Interest on investment	114	46
Insurance and housing	32	13
Interest on land, $22,240/ha @ 6.8% per annum	1,512	612
Other overhead	99	40
TOTAL FIXED COSTS	**2,249**	**910**
TOTAL "FOURTH YEAR" COSTS	**3,647**	**1,476**

Table 21.--Peach "Fourth Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Pruning	a	59.3	24.0	415.13	168.00
Discing	4	4.94	2.0	84.46	34.18
Sow cover crop	1	2.47	1.0	31.53	12.76
Weed spraying	1	2.47	1.0	52.95	21.43
Spray Pesticide	8	9.88	4.0	346.43	140.20
Mowing	3	3.71	1.5	108.92	44.08
Painting trees	a	34.6	14.0	164.32	66.50

a Operation performed as required.

Table 22.--Peach Total Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
Preplanting Year	1,732	701
Planting Year	6,606	2,673
Second Year	2,682	1,085
Third Year	3,203	1,296
Fourth Year	3,647	1,476
TOTAL	17,870	7,231

CONCLUSIONS

The total cost of establishing this new peach orchard, estimated at $7,231 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 15 years, the establishment cost should be amortized over the 15-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 6.8 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $7,231 establishment cost using a 6.8 percent rate, gives an annual cost of $784 per acre for each year of the production period.

GRAPE VINEYARD ESTABLISHMENT

The vineyard under consideration is planted 600 vines per acre. The establishment of this vineyard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the vines to grow to bearing age.

Table 23.--Grape "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Tractor and machine costs:		
Repairs and maintenance	22	9
Fuel	17	7
Interest on operating capital	20	8
TOTAL VARIABLE COSTS	**59**	**24**
FIXED COSTS		
Operator labour, 9.9 hr./ha.	79	32
Tractor and machine costs:		
Depreciation	47	19
Interest on investment	30	12
Insurance and housing	10	4
Interest on land, $11,120/ha @ 6.8% per annum	378	153
TOTAL FIXED COSTS	**544**	**220**
TOTAL "PREPLANT YEAR" COSTS	**603**	**244**

Table 24.--Grape "Preplant Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	2.47	1.0	56.22	22.75
Discing	2	2.47	1.0	47.17	19.09
Rotovating	1	2.47	1.0	52.68	21.32
Soil packing	1	2.47	1.0	49.57	20.06

Table 25.--Grape "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 84.0 hr./ha.	489	198
Fertilizer, 15-15-15, [illegible] kg./ha.	22	9
Fungicides	49	20
Grape vines, 600	2,372	960
Trellis materials	2,765	1,119
Cover crop seed	12	5
Tractor and machine costs:		
Repairs and maintenance	161	65
Fuel	190	77
Equipment rental	124	50
Interest on operating capital	3,032	1,227
TOTAL VARIABLE COSTS	**9,216**	**3,730**
FIXED COSTS		
Operator labour, 81.5 hr./ha.	652	264
Tractor and machine costs:		
Depreciation	378	153
Interest on investment	232	94
Insurance and housing	86	35
Interest on land, $11,120/ha @ 6.8% per annum	756	306
Other overhead	99	40
TOTAL FIXED COSTS	**2,203**	**892**
TOTAL "PLANTING YEAR" COSTS	**11,419**	**4,622**

Table 26.--Grape "Planting Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Discing	2	2.47	1.0	42.23	17.09
Levelling	1	2.47	1.0	39.34	15.92
Picking up vines and supplies	a	4.94	2.0	98.99	40.06
Planting	a	24.7	10.0	352.24	142.55
Trellis erection	a	89.0	36.0	1,129.44	457.08
Spray pesticide	2	2.47	1.0	86.61	35.05
Weed control	1	4.94	2.0	98.69	39.94
Discing	2	2.47	1.0	42.23	17.09
Rotovating	2	4.94	2.0	95.48	38.64
Summer pruning & tying	a	24.7	10.0	172.97	70.00
Sow cover crop	1	2.47	1.0	31.53	12.76

a Operation performed as required.

Table 27.--Grape "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 66.7 hr./ha.	371	150
Fertilizer:		
Ammonium nitrate, 111 kg./ha.	27	11
15-15-15, 100 kg./ha.	22	9
Insecticides	32	13
Fungicides	77	31
Replacement vines, 30	119	48
Trellis materials	329	133
Cover crop seed	12	5
Tractor and machine costs:		
Repairs and maintenance	72	29
Fuel	47	19
Interest on operating capital	385	156
TOTAL VARIABLE COSTS	**1,493**	**604**
FIXED COSTS		
Operator labour, 40.8 hr./ha.	326	132
Tractor and machine costs:		
Depreciation	126	51
Interest on investment	82	33
Insurance and housing	25	10
Interest on land, $11,120/ha @ 6.8% per annum	756	306
Other overhead	99	40
TOTAL FIXED COSTS	**1,414**	**572**
TOTAL "SECOND YEAR" COSTS	**2,907**	**1,176**

Table 28.--Grape "Second Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replacing vines	a	7.41	3.0	44.48	18.00
Pruning	a	24.7	10.0	169.88	68.75
Tying	a	14.8	6.0	74.13	30.00
Install second wire	a	14.8	6.0	168.43	68.16
Weed control	1	4.94	2.0	98.69	39.94
Discing	2	2.47	1.0	42.23	17.09
Rotovating	2	4.94	2.0	95.48	38.64
Spray Pesticide	3	3.71	1.5	129.90	52.57
Fertilizing	1	2.47	1.0	31.53	12.76
Summer prune & tie	a	24.7	10.0	160.61	65.00
Sow cover crop	1	2.47	1.0	31.53	12.76

a Opération performed as required.

Table 29.--Grape "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 65.5 hr./ha.	361	146
Fertilizer:		
Muriate of potash, 420 kg./ha.	89	36
15-15-15, 100 kg./ha.	22	9
Insecticides	106	43
Fungicides	168	68
Herbicides	44	18
Manure, 22.4 t/ha.	247	100
Replacement vines, 24	94	38
Cover crop seed	12	5
Tractor and machine costs:		
Repairs and maintenance	84	34
Fuel	40	16
Interest on operating capital	267	108
TOTAL VARIABLE COSTS	**1,534**	**621**
FIXED COSTS		
Operator labour, 38.3 hr./ha.	306	124
Tractor and machine costs:		
Depreciation	146	59
Interest on investment	104	42
Insurance and housing	30	12
Interest on land, $11,120/ha. @ 6.8% per annum	756	306
Other overhead	99	40
TOTAL FIXED COSTS	**1,441**	**583**
TOTAL "THIRD YEAR" COSTS	**2,975**	**1,204**

Table 30.--Grape "Third Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Replacing vines	a	4.94	2.0	29.65	12.00
Pruning	a	34.6	14.0	237.84	96.25
Tying	a	14.8	6.0	74.13	30.00
Fertilizing	1	2.47	1.0	31.53	12.76
Manuring	1	3.71	1.5	99.90	40.43
Weed spraying	1	2.47	1.0	52.95	21.43
Discing	2	2.47	1.0	42.23	17.09
Rotovating	2	4.94	2.0	95.48	38.64
Spray Pesticide	5	6.18	2.5	216.51	87.62
Summer prune & tying	a	24.7	10.0	160.61	65.00
Sow cover crop	1	2.47	1.0	31.53	12.76

a Operation performed as required.

Table 31.--Grape "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 66.7 hr./ha.	363	147
Fertilizer:		
Ammonium nitrate, 170 kg./ha.	40	16
15-15-15, 100 kg./ha.	22	9
Insecticides	190	77
Fungicides	257	104
Herbicides	44	18
Cover crop seed	12	5
Tractor and machine costs:		
Repairs and maintenance	89	36
Fuel	35	14
Interest on operating capital	74	30
TOTAL VARIABLE COSTS	**1,126**	**456**
FIXED COSTS		
Operator labour, 44.5 hr./ha.	356	144
Tractor and machine costs:		
Depreciation	124	50
Interest on investment	86	35
Insurance and housing	27	11
Interest on land, $11,120/ha. @ 6.8% per annum	756	306
Other overhead	99	40
TOTAL FIXED COSTS	**1,448**	**586**
TOTAL "FOURTH YEAR" COSTS	**2,574**	**1,042**

Table 32.--Grape "Fourth Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machines costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Pruning	a	44.5	18.0	305.78	123.75
Tying	a	19.8	8.0	98.84	40.00
Fertilizing	1	2.47	1.0	31.53	12.76
Discing	2	2.47	1.0	42.23	17.09
Rotovating	2	4.94	2.0	95.48	38.64
Weed spraying	1	2.47	1.0	52.95	21.43
Spray Pesticide	6	7.41	3.0	259.83	105.15
Summer prune & tying	a	24.7	10.0	160.61	65.00
Sow cover crop	1	2.47	1.0	31.53	12.76

a Operation performed as required.

Table 33.--Grape Total Cost of Establishment, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
Preplanting Year	603	244
Planting Year	11,419	4,622
Second Year	2,907	1,176
Third Year	2,975	1,204
Fourth Year	2,574	1,042
TOTAL	**20,478**	**8,288**

CONCLUSIONS

The total cost of establishing this new vineyard, estimated at $8,288 per acre, should be charged over the productive life of the grapery. If the productive life of the vineyard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 6.8 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $8,288 establishment cost using a 6.8 percent rate gives an annual cost of $770 per acre for each year of the production period.

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